CLAIMS

1. A method of transforming a motion in a volume screw machine, said machine having at least two sets of conjugated elements (80, 70; 60, 50), each set comprising a first element (80, 60) having an inner screw surface (180, 160) centred around a first axis (passing through centre O) and a second element (70, 50) having an outer screw surface (270, 250) centred around a second axis (passing through centres O_{m2}, O_{m1}), wherein an inner set (50, 60) of conjugated elements is placed coaxially in at least one cavity of the second element of an outer set (80, 70) of conjugated elements,

wherein the first and second axes (passing through centres O; O_{m1}, O_{m2}) are parallel and wherein at least one of said first and second elements of each set is rotatable about its axis,

said method comprising:

the creation of a rotary motion of at least one element in each set.

2. The method of claim 1, characterized in that the motion of said elements is synchronized in such a manner as to provide for a dynamically balanced machine.

3. The method of claim 1 or 2, characterized in that each set comprises an element centred about an axis which coincides with a principal axis of the machine, and wherein the respective second element of each set is centred about an axis which is not coinciding with the principal axis, wherein the non-coinciding axes are rotated in such a manner about the principal axis as to maintain the distance relationship of the non-coinciding axes with regard to each other and with regard to the principal axis.

4. The method of any of claims 1 to 3, characterized in that

said first axes of each set of conjugated elements coincide, whereas the second axes are non-coinciding, or that said second axes of each set of conjugated elements coincide whereas the first axes are non-coinciding,

and that the non-coinciding axes (passing through centres O_{m1}, O_{m2}) are rotated in such a manner about the coinciding axes (passing through centre O) as to maintain the distance relationship of the non-coinciding axes (passing through centres O_{m1}, O_{m2}) with regard to each other and with regard to the coinciding axes (passing through centre O).

5. The method of any of claims 2 to 4, characterized in that
a motion of the elements of different sets of conjugated elements about their respective axes is synchronized.

6. The method of any of claims 1 to 5, characterized in that
of a first group of rotations comprising

a) the rotation of the first element of one set of conjugated elements about the first axis,
b) the rotation of the second element of one set of conjugated elements about the second axis,
c) a rotation of the first axis about the second axis or a rotation of the second axis about the first axis,

at least two rotations are mechanically synchronized each with a respective one of a second group of rotations comprising

d) the rotation of the first element of another set of conjugated elements about the first axis,
e) the rotation of the second element of another set of conjugated elements about the second axis.

7. The method of claim 6,
wherein first and second sets of conjugated elements each comprise a planetarily moving element, and wherein the rotations of the axes of the planetarily moving elements of the first and second sets are synchronized, and wherein the rotations of the planetarily moving elements about their respective axes are synchronized.

8. The method of claim 6,
wherein first and second sets of conjugated elements each comprise a differential motion, and wherein rotations of the axes of the first elements of the first and second sets are synchronized, and wherein

rotations of the axes of the second elements of the first and second sets are synchronized.

9. The method of claim 6,

wherein a first set of conjugated elements comprises a planetary motion and a second set of conjugated elements comprises a differential motion, and wherein rotations of the axes of the first elements of the first and second sets are synchronized, and wherein rotations of the axes of the second elements of the first and second sets are synchronized.

10. The method of claim 6,

wherein a first set of conjugated elements comprises a planetary motion and a second set comprises a synchronization coupling link (O_{m1}-O; O_{m2}-O) for providing a differential motion, and wherein a rotation of the axis of an element of the first set of conjugated elements is synchronized with a rotation of the synchronizing coupling link of the second set of conjugated elements.

11. The method of any of claims 1 to 10,

characterized in that curvilinear inner surfaces (180, 170, 160) of the first elements (80, 70, 60) are put into mechanical contact with curvilinear outer surfaces (270, 260, 250) of the second elements (70, 60, 50), thereby carrying out said motion transfer.

12. A volume screw machine of rotary type, comprising at least two sets of conjugated elements (80, 70; 60, 50), each set comprising a first element (80, 60) having an inner screw surface (180, 160) and enclosed therein a second element (70, 50) having an outer screw surface (270, 250), said machine comprising an outer set of conjugated elements (80, 70) and at least one inner set of conjugated elements (60, 50), wherein each inner set of conjugated elements (60, 50) is placed in a cavity of an element (70) of another set of conjugated elements (80, 70).

13. The screw machine of claim 12,

characterized in that rotatable elements of the different sets of conjugated elements are mechanically coupled to each other such as to provide for a synchronized motion of said elements.